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On dead leaves, Nicaragua. — Has the habit of *Strigula*.

171. *MELIOLA DICHOTOMA*, Berk. & Curt.: subiculo velutino; peritheciis magnis, appendiculis uni-bifurcatis, ramulis elongatis.

On leaves of some climbing plant, Japan.

CYSTOTHECA, Berk. & Curt.

Perithecia globosa, e floccis rigidis brunneis oriunda. Ascus unicus, sacco hexagono-celluloso circumdatus. — Genus pulcherrimum *Myxothecio*, *Pisomyxa*, &c. affine, foliis innascens.

172. *CYSTOTHECA WRIGHTII*, Berk. & Curt. Forming thin chocolate-colored patches on the under surface of leaves. *Perithecia* globose, $\frac{1}{400}$ inch in diameter, containing a single hyaline, globose, beautifully reticulate sac, within which is an ascus of the same form. Sporidia in our specimens imperfect.

173. *ASCOMYCES DEFORMANS*, Berk. Mss. (Vide Gard. Chron. 1856, p. 470): candidissimum, compactum, matricem deformans.

On *Trientalis*, Petropaulowski, Kamtschatka.

174. *SPHERIA CULLUMIÆ*, Berk. & Curt.: primum epidermide tecta, subpustulata, demum nuda, subglobosa, obtusa, ore minutissimo perforata; ascis brevibus curvis; sporidiis biseriatis clavato-lanceolatis demum uni-triseptatis.

On leaves of *Cullumia squarrosa*. Cape of Good Hope. — Sporidia at first simple, then binucleate, at length uniseptate, or very rarely triseptate, brown, $\frac{1}{1500}$ inch long, lanceolate, but broader at the upper end. — On the same leaves there is a minute *Leptostroma*, but without fruit.

Four hundred and fifty-eighth meeting.

January 11, 1859. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from the War Department, accompanying Vols. II. – VIII. of the Pacific Railroad Surveys; from the Minister of the Interior of the Netherlands, presenting folio 14 of the Geological Maps of Holland; and from Dr. I. I. Hayes of Philadelphia, acknowledging the receipt of a copy of the resolutions of the Academy upon the subject of his proposed Arctic expedition.

Professor Gray gave a series of illustrations of the Botany of Japan in its relations to that of Central and Northern Asia, Europe, and North America, — the communication being a portion of one of the papers presented by him at the last preceding meeting.

He showed that the relations of the Flora of Japan with that of the United States east of the Mississippi were peculiarly intimate, as evinced by the great number of congeneric, of closely representative, and of identical species in the two floras, noting especially that most of the more striking points of similarity were presented in species or in types which are absent from the flora of Europe. Also, that although there is a considerable number of species common to the western side of the American continent and to Japan, yet that the likeness was less strong between their floras than between those of Eastern North America and of Japan, although the latter are geographically separated by about one hundred and forty degrees of longitude. Also, that far more Eastern American species or types are represented in Eastern Asia, than of Western American in Europe, or even in Asia; — thus pointing to a remarkable interchange between the floras of Eastern North America and Eastern Asia; or to a former homogeneousness of the temperate American and East-Asian floras, to a degree equal, perhaps, to that of the Arctic or the sub-Arctic flora at the present time.

Comparisons formerly instituted by Professor Gray between the flora of the Northern United States and that of other parts of the northern temperate zone had already suggested to others, as well as to himself, the inference that the interchange between these floras had taken place mainly *via* Asia, and not *via* Europe; and it would be seen that our now largely increased knowledge of the botany of the Japanese and of the Himalayan regions strengthened this inference.

In presenting the subject, Professor Gray could hardly avoid using the words “interchange” and “dispersion of species.” He had used them only in drawing his conclusions from the

facts, and wished to do so without prejudging the question involved. But he was free to say that the present investigation had confirmed his impression that such terms were properly employed. For although some of these facts would at first seem most readily explicable upon the supposition of the double origin of those species whose present geographical areas are widely dissevered, yet, in his opinion, they would be found, on considering the whole case, far more conformable to the hypothesis of a single local origin for each species at an early time. And in his opinion the actual question now is, — whether each species originated in one local area, whence it has spread, as circumstances permitted, over more or less broad tracts, in some cases becoming discontinuous in area through changes in climate or other physical conditions operating during a long period of time; or, whether each species originated where it now occurs, probably in as great a number of individuals occupying as large an area, and generally the same area, or even the same discontinuous areas, as at the present time. The latter is understood to be the view of Professor Agassiz.

To this view Professor Gray objected: — 1. That it offers no *scientific* explanation of the present distribution of species over the globe; but simply supersedes explanation, by affirming, that as things now are, so they were at the beginning; whereas the facts of the case — often very peculiar — appear to demand from science something more than a direct reference of the phenomena as they are to the Divine will.

2. That the idea of the descent of all similar or conspecific individuals from a common stock is so natural, and so inevitably suggested by common observation, that it must needs be first tried upon the problem; and if the trial be satisfactory, its adoption would follow as a matter of course.

3. That, since it is conceded that the present era of the world is of extremely long duration, and since it is most probable, not to say certain, that the existing species of plants of the regions in question, or a part of them, are of

high antiquity, dating back to the post-tertiary, or even to the later tertiary epoch,—and therefore must have been subject to great climatic changes, accompanied or caused by no inconsiderable changes in the relative extent and configuration of the land,—the objections formerly raised against such wide dispersion of species lose most of their force. And the explanation of such anomalies in the actual distribution of species is to be sought in the vicissitudes to which the species must have been subject in their earlier days.

Professor Gray proceeded briefly to intimate, that, if the present flora of the northern hemisphere preceded the glacial period, or even immediately succeeded it, the actual distribution of species, and the interchange between this continent and Eastern Asia under similar parallels of latitude, could be readily accounted for on the ordinary view; or at least would offer no greater difficulty than the Arctic flora now does,—the general homogeneousness of which round the world has never been thought difficult of explanation. He proposed to illustrate his views upon this part of the subject at a future meeting.

Professor Agassiz remarked, that the animal kingdom presented a resemblance between its representatives of Eastern North America and Eastern Asia similar to that mentioned by Dr. Gray in the flora, and that he has especially pointed out this correspondence in detail in the order of Testudinata, in his Contributions to the Natural History of North America. He acknowledged the correctness of the views ascribed to him by Dr. Gray, and would defend them on the ground that, connecting the present state of things with that which prevailed in earlier geological periods, it could be shown that the present distribution of animals was linked with that of earlier periods in a manner which excluded the assumption of extensive migrations, or of a shifting of the floræ and faunæ from one area to another.

He viewed the similarity between the fauna of Northeastern America and that of Northeastern Asia, not as the result of climatic changes over an area primitively more

homogeneous in its organic productions and modified by climatic changes, but as a primitive adaptation of organic types to similar corresponding physical features, which have remained respectively unchanged since the first introduction upon earth of these organisms. Admitting with Dr. Gray the immensely long duration of even the present period, he did not think that the regular order and organic connection which everywhere exist between the different types of animals and plants upon the whole surface of our globe, could have been established by physical changes, or even essentially modified by them. With reference to the single origin of conspecific individuals, he thought that the warfare which so many species wage upon others was in itself an insuperable objection to the assumption that any one species could have originated in a single pair.

The President remarked, that the appearance of the same species on different or opposite parts of the globe admitted of explanation by supposing that originally a zone, or isothermal belt, which existed in each climate, contained all the species capable of flourishing in that climate so long as the climate remained stationary; and that in the lapse of ages a great portion of these plants had disappeared or died out, under the casualties to which plants are liable, some having disappeared altogether, and others remaining only in localities, defined by longitudes, in different parts of the same zone; so that at the present day, while the general character of the vegetation is different in different hemispheres and countries, still a sufficient number of species might be extant in, and common to, both hemispheres, to represent a part of the original growth. This explanation appeared to him more probable than the supposition that these plants had more recently migrated from any one country to its antipodes, passing over the intermediate regions.

Professor Gray rejoined, that his views would in a good degree harmonize with those of the President, with the important exception that he regarded any former more homo-

geneous state of the temperate flora as itself a resulting, not an original condition. Still less, therefore, could he coincide with Professor Agassiz, in regarding the actually present distribution, with all its dislocations, as a primitive state. Whether a much larger number of species than now were ever common to Japan and to New England, and whether these at any one time inhabited the whole intermediate ground, appeared to him uncertain, and was unnecessary to suppose; but he had no idea that *recent* migration had anything to do in accounting for the present existence of the same species in such widely separated stations.

Four hundred and fifty-ninth meeting.

January 26, 1859. — STATED MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from the Royal Belgian Academy, Brussels, acknowledging the reception of publications from the American Academy, and presenting its own recent Memoirs. Also, a letter from the President of the Royal Bavarian Academy of Sciences, Munich, announcing the intended celebration of the centennial anniversary of the foundation of that society on the 28th of March ensuing, and inviting the participation of the American Academy.

On motion of Mr. Winthrop, seconded by Professor Felton, Dr. Charles Beck, being now in Europe, was appointed to represent this Academy upon that occasion.

Professor John Lindley was elected a Foreign Honorary Member, in Class II. Section 2 (Botany), to fill the vacancy made by the decease of the late Robert Brown.

Sir William E. Logan, Director of the Geological Survey of Canada, was elected an Associate Fellow, in Class II. Section 1 (Geology, &c.).

William Watson Goodwin, Ph. D., of Cambridge, was chosen a Resident Fellow, in Class III. Section 2 (Philology, &c.).